

# CLEARWATER/NEZ PERCE

## FIRE DANGER OPERATING PLAN

**2010**

**Prepared By:** Laura Barrett, Zone Fire Planner  
Stu Hoyt, FMO Moose Creek District  
Linnea Keating, National RAWS Coordinator  
Linda Laing, Zone RAWS Coordinator  
Steve Munson, AFMO Salmon River District  
Mark Wilson, FMO Powell District

APPROVED: *Bob Fippincott*  
Clearwater and Nez Perce N.F.  
Fire Staff Officer

Date: 07-07-2010

APPROVED: *Don Wagner*  
Idaho Department of Lands

Date: 07-07-2010

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## **Introduction**

The outline of this document follows recommendations from Chapter 9, Parts B and C of the “Interagency Standards for Fire and Fire Aviation Operations, 2004” otherwise known as “The Red Book” and FSM 5124.05 –Fire Danger Rating Operating Plan. This plan documents a method of determining fire suppression staffing levels, public awareness of area fire danger and a consistent method of determining fire-related operating restrictions for local industries and the general public.

### **Participating Agencies:**

1. Clearwater National Forest
2. Nez Perce National Forest
3. Idaho Department of Lands

## **I. Roles and Responsibilities**

### **A. NFDRS Committee**

The NFDRS Committee has program oversight responsibilities which include:

1. Assigning technical specialists as needed to provide input for management decisions related to the current fire danger operating plan.
2. Budgeting and appropriate site selection and placement of weather stations.
3. Assuring that plan quality control standards are maintained.
4. Determining needs and maintenance budgets for equipment and personnel.
5. Recommending staffing breakpoints to Zone FMO group.
6. Meeting annually to review data from the season and make recommendations on next seasons operating procedures and equipment changes.

The 2010 NFDRS Committee consists of:

Laura Barrett, Zone Fire Planner  
Stu Hoyt, DFMO Moose Creek District  
Linnea Keating, National RAWS Coordinator  
Linda Laing, Zone RAWS Coordinator  
Steve Munson, AFMO Salmon River District  
Mark Wilson, DFMO Powell District

## **B. Center Manager Grangeville Interagency Dispatch Center (GVC)**

Will designate a RAWS Coordinator whose specific duties and responsibilities include:

1. Providing quality control checks of data used by the plan.
2. Notifying NFDRS committee if problems requiring interagency consensus or funding above general operating funds are needed.
3. Providing point of contact as subject matter expert on the local NFDRS System
4. Monitoring and scheduling needed maintenance for weather stations and assisting field techs in ordering the required parts and performing the annual maintenance.
5. Assuring that all maintenance performed gets entered into the official maintenance record (ASCADS or CMMS).
6. Providing training opportunities to promote the understanding of NFDRS.
7. Managing station catalogs in WIMS.
8. Providing needed reports and data to users.
9. Assisting Grangeville Interagency Dispatch Center Personnel in the day to day operations and monitoring of the Weather Information Management System (WIMS). Duties will include:
  - a. Daily, during fire season, input of weather into the WIMS.
  - b. Daily, during fire season, monitoring of station operation and reporting problems to the RAWS Coordinator
  - c. Providing processed indices to the field and operating units.
  - d. Posting of ERC values on the GVC web page.

## **C. Fire Wardens/ Fire Management Officers**

Provide the eyes in the field and ground truth the data. Duties include:

1. Providing feedback to GVC on changes to live fuel moisture vegetation in the field such as green up, curing, and freezing.
2. Notifying GVC of any apparent irregularity in field conditions versus fire weather forecasts or indices.
3. Providing representation to the NFDRS Committee.
4. Having final approval of NFDRS Committee recommendations.
5. Providing Field Personnel, as needed, to assist in station maintenance and field data. Duties of these techs include:
  - a. Performing the annual station maintenance and any needed emergency repairs

- b. Keeping their weather station records and reporting the maintenance to the RAWS Coordinator for submission to the ASCADS database
- c. Taking a RAWS training course when possible

#### **D. Maintenance Contractor**

Maintenance for all RAWS is provided through a BLM depot maintenance agreement with the exception of two FTS portable units that are under a return-to-factory maintenance agreement.

## **II. Fire Danger Rating Inventory**

#### **A. Administrative Area:**

This NFDRS Operating Plan covers nearly 7 million acres, mostly in Latah, Clearwater, Nez Perce and Idaho counties in north central Idaho. The area includes lands cooperatively protected by the Clearwater and Nez Perce National Forests and the Idaho Department of Lands. BLM lands within this area are protected by the above agencies.

#### **B. Fire History:**

This plan uses fire history from the years 2000 through 2009.

#### **C. Weather Station Network:**

The current north central Idaho network contains 13 permanent fire weather monitoring stations located throughout the area. Not all stations operate year round; however, those stations that do may not have heated rain gauges or sensors, so data outside of the normal fire season should be viewed with caution.

Station	WIMS ID	Operational	Forest	Elevation	Aspect	Site	NFDRS FM/Indices
Dent	100714	Seasonal	IDL	1652	S	Valley	Model G/ ERC
Eagle	100717	Seasonal	CWF/IDL	5700	S	Ridgetop	Model G/ ERC
Kelly	100708	Seasonal	CWF	2737	S	Valley	Model G/ ERC
Pierce	100711	Year Round	CWF	3085	E	Valley	Model G/ ERC
Potlatch	100603	Seasonal	CWF	2500	S	Valley	Model G/ ERC
Powell	101031	Year Round	CWF	3409	S	Valley	Model G/ ERC
Roundtop	101049	Seasonal	CWF	6560	Flat	Ridgetop	Model G/ ERC
Shock	100606	Seasonal	CWF	3360	S	Ridgetop	Model G/ ERC
Fenn	101013	Year Round	NPF	1638	SW	Valley	Model G/ ERC
Moose Creek	101028	Seasonal	NPF	2460	Flat	Valley	Model G/ ERC
Red River	101045	Year Round	NPF	4600	S	Valley	Model G/ ERC
Slate Creek	101037	Year Round	NPF	1568	W	Valley	Model C/ ERC
Southfork	101050	Year Round	NPF	4600	S	Ridgetop	Model G/ ERC

#### **D. Fuel/Vegetation Types:**

The predominate vegetation type found within the NFDRS operating area is best represented by fuel model G although lower elevations around the Zone such as Slate Creek often use Fuel Model C to help describe potential fire behavior .

***Fuel Model G:*** Closed, short-needle conifer (heavy dead). Fuel Model G is used for dense conifer stands where there is a heavy accumulation of litter and downed woody material. Such stands are typically over mature and may also be suffering insect, disease, wind, or ice damage – natural events that create a very heavy buildup of dead material on the forest floor. The duff and litter are deep and much of the woody material is more than 3 inches in diameter. The undergrowth is variable, but shrubs are usually restricted to openings.

#### **E. Topography:**

This area is typified by rugged mountainous terrain. Elevations range from 1700 feet to in excess of 7,500 feet.

#### **F. Climatology:**

Weather varies greatly across the zone. High temperatures vary from over 100 degrees, in the river canyons, to the 70's at high elevations. Rainfall varies from 18 – 40 inches and snow can fall during any month of the year. Weather systems generally move from southwest to northeast and are influenced greatly by the continental divide. Large amounts of lightning are generated by thunderstorms in the summer months. Fire season usually begins in late June and slows in late September. Since the 1990's the season ending date is trending towards the end of September into October.

#### **G. Fire Danger Rating Area:**

The Fire Danger Rating Area is delineated by lands primarily associated with slope class 3 (41-55%) and climate class 3 (sub humid, rainfall deficient summer) except for Potlatch/Shock/Creek for slope class 2 and Slate Creek which is climate class 2.

### **III. Fire Danger Indices and Fire Business**

The energy release component (ERC) was used to determine breakpoints for the planning area. This indice was found to have the closest correlation between historical weather and fire occurrence in the area.

The planning area has reliable weather and fire occurrence data from 1994 through 2009.

The following tables represent the breakpoints that are being used for each weather station, where 5 Fire Danger Adjective Ratings are based on the Staffing Index (SI):

Low:  $0 - SI (90\% \times 0.25)$

Moderate:  $(SI (90\% \times 0.25 + 1) - SI (90\% \times 0.5))$

High:  $(SI (90\% \times 0.5) + 1) - SI (90\%)$

Very High:  $(SI (90\%) + 1) - SI (97\%)$

Extreme:  $SI > 97\%$

#### IV. Fire – Danger Based Decisions

Station	Low	Moderate	High	Very High	Extreme
Dent	0 – 18	19 – 36	37 – 70	71 – 76	76+
Fenn	0 – 13	14 – 26	27 – 51	51 – 60	60+
Kelly Creek	0 – 12	13 – 25	26 – 49	50 – 57	57+
Moose Creek	0 – 15	16 – 30	31 – 60	61 – 66	66+
Pierce	0 – 11	12 – 22	23 – 44	45 – 50	50+
Potlatch	0 – 16	17 – 32	33 – 63	64 – 70	70+
Powell	0 – 14	15 – 27	28 – 53	54 – 59	59+
Red River	0 – 13	14 – 25	26 – 49	50 – 54	54+
Roundtop	0 – 18	19 – 36	37 – 71	72 – 77	77+
Shock	0 – 19	20 – 39	40 – 78	79 – 85	85+
Slate Creek	0 – 20	21 – 40	41 – 78	79 – 84	84+

Based on analysis of 1999 – 2008 fire weather and fire business it was determined that the three Special Interest Groups (SIG) that the fire zone had been using for determining the fire danger adjective rating could be realigned to better capture trends across the zone on both National Forest system lands as well as State of Idaho lands. Two SIG's were identified that represented the river breaks and the uplands. The RAWS stations used to define these SIGS are: River breaks – Slate Creek RAWS and Fenn RAWS. Uplands – Powell RAWS, Moose Creek RAWS and Red River RAWS. The Riverbreaks defines conditions found along the Salmon River, South Fork Clearwater River, Middle Fork Clearwater River, Lochsa and Selway Rivers below an elevation of approximately 3000'. The Uplands SIG defines conditions found on all other NFS and Idaho State lands within the fire zone.

The weighting of these SIGS are:

River Breaks SIG: full weighting of Slate Creek RAWS and 57% Fenn RAWS

*The rationale for weighting of Slate-Fenn RAWS SIG is found in appendix d.*

Uplands SIG: equal weighting of Powell, Red River and Moose Creek RAWS

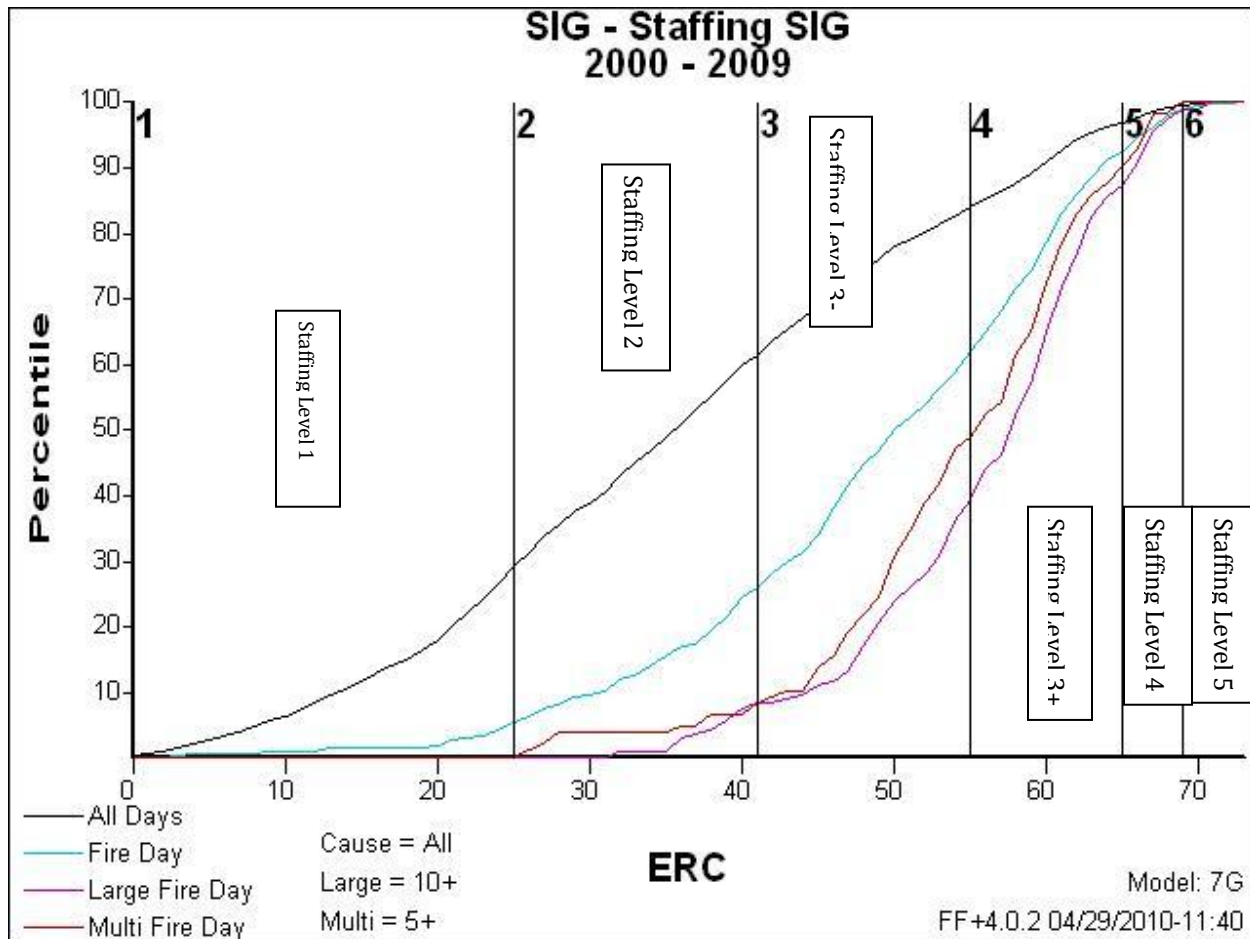
Station	Low	Moderate	High	Very High	Extreme
River Breaks SIG	0 – 15	16 – 31	32 – 61	62 – 68	68+
Uplands SIG	0 – 14	15 – 27	28 – 54	55– 60	60+

#### V. Staffing Break Points.

Staffing levels breakpoints for the Clear/Nez Fire Zone are based on the three day average Energy Release Component value from four RAWS stations (Powell, Moose Creek, Red River and Slate Creek). This provides a range of elevations and fuel conditions that are found across the entire zone. The elevations range from a low of 1500 feet at the Slate Creek RAWS station up to 4600' at the Red River RAWS. Precipitation during the summer fire season can be spotty

with short duration wet thunderstorms that can deliver a great quantity of precipitation over small areas to weather systems that bring widespread precipitation to the zone. This network of RAWS stations being spread out over a large portion of the two forests will capture the differences across the zone. One station receiving precipitation will only have 25% influence over the SIG ERC value. If all stations receive moisture then the zone ERC would fall accordingly.

The percentile values for Fire Days, Large Fire Days and Multi Fire Days from this combination shows strong corresponding trendlines through the season. Using breakpoint for six staffing levels there are slope changes closely associated with the ERC values at 97<sup>th</sup>, 90<sup>th</sup>, 66<sup>th</sup> and 24<sup>th</sup> percentiles. At each of the percentiles there is an associated change in the slope of curve showing increasing or decreasing fire business levels.



Staffing break points for the zone are:

Staffing Level	ERC Range
Staffing Level 1	0 – 25
Staffing Level 2	25 – 41
Staffing Level 3-	41 – 55
Staffing Level 3+	55 – 65
Staffing Level 4	65 – 69
Staffing Level 5	69+



## **VI. Operational Procedures for NFDRS**

Reference the following in the latest Clear/Nez Fire Management Plan:

Initial Attack Dispatch Guide

Adjective Rating, Forest and Zone

Suggested Staffing and Specific Action Guide

## **VII. Program Needs**

Weather Station Sites:

An overall review of our station numbers and their locations should be undertaken to assure that the network meets the needs of the Zone. The majority of our stations are sited in valley bottoms, many at ranger stations. The remainders are on ridgetops. In 2010 a new station is being added to the network. This station will be sited on the Lochsa Ranger District on FR 5515. This station will be a midslope location. As this new station and the existing South Fork RAWS mature it will provide an opportunity to relocate some of the existing stations that are not currently providing significant fire weather data.

Lifecycle rotation costs for 17 stations, as discussed below, may also be a consideration in determining the future size of our network.

Computer Equipment/Software -

NFDRS and other training: Continue providing training to forest employees to ensure that problems can be responded to in a timely manner. Currently there are a handful of employees that are trained to maintain our stations. As these employees retire or transfer it is important to identify a development plan to train replacements.

Budget Considerations: At this time, the mandatory 2011 upgrade to high data rate GOES transmitters has been accomplished for all of our stations except Tess portable. There are no other upgrades required at this time, but there may be occasional, unforeseen costs if equipment fails or is damaged.

Fifteen of our stations have Vaisala 555 data collection platforms (DCPs). These are no longer being manufactured. The NIFC RAWS Depot purchased the remainder of the manufacturer's stock and will continue to support these DCPs for the foreseeable future. However, as budget allows, we should begin a phased replacement in order to avoid a situation where many of our stations require simultaneous equipment replacement. The current cost to replace a 555 DCP is approximately \$8,800.00 if the existing sensors are retained: \$11,000.00 with recommended new sensors.

To maintain the current network of RAWS these stations must be put into a replacement cycle. With current budget constraints there is the ability to replace one station per year. The replacement cycle would start with the oldest equipment. The recommendation of the NFDRS committee is to begin replacement of the five RAWS stations being used for indices. Identify which of these stations is the oldest, replace the DCP with new equipment, and use the replaced DCP to swap out our oldest equipment in the network. In five years these stations would be replaced and we would be in a rotation cycle to replace all equipment in a fifteen year period.

## **APPENDIX A**

### **Fire Danger/Smokey signs on the Forests**

#### **Current locations**

##### **Clearwater Forest:**

Clearwater Supervisors Office  
Highway 12 at Supervisors Office Orofino

North Fork Ranger District  
None

Palouse Ranger District  
At Ranger Station Potlatch Idaho

Lochsa Ranger District  
Highway 12 at Swan Creek Road mp 87

Powell Ranger District  
Highway 12 at Lolo Pass

##### **Nez Perce Forest:**

Nez Perce Supervisor's Office  
Airport Road at Supervisors Office Grangeville

Slate Creek Ranger District  
Highway 95 at the Slate Creek Ranger Station  
Salmon River Road at Shorts Bar

Clearwater Ranger District  
Highway 14 at the Southfork Campground

Elk City Ranger District  
Highway 14 at the Elk City rodeo grounds  
Dixie Road at the Red River Station

Moose Creek Ranger District  
Selway River Road at the Fenn Ranger Station  
Moose Creek Ranger Station

##### **Idaho Department of Lands:**

Maggie Creek Office  
Hwy 12  
Weippe

CPTPA  
Orofino  
Headquarters

## **Appendix B**

Documentation/description of each RAWS on the Clearwater/Nez Perce Zone

NOTE: TOO LARGE TO INCLUDE ON WEBSITE, FULL APPENDIX IS LOCATED ON THE FOREST SERVICE SYSTEM UNDER FSFILES – OFFICE -- FIRE -- FIRE DANGER OPERATING PLAN -- NFDRS PLAN

## **APPENDIX C**

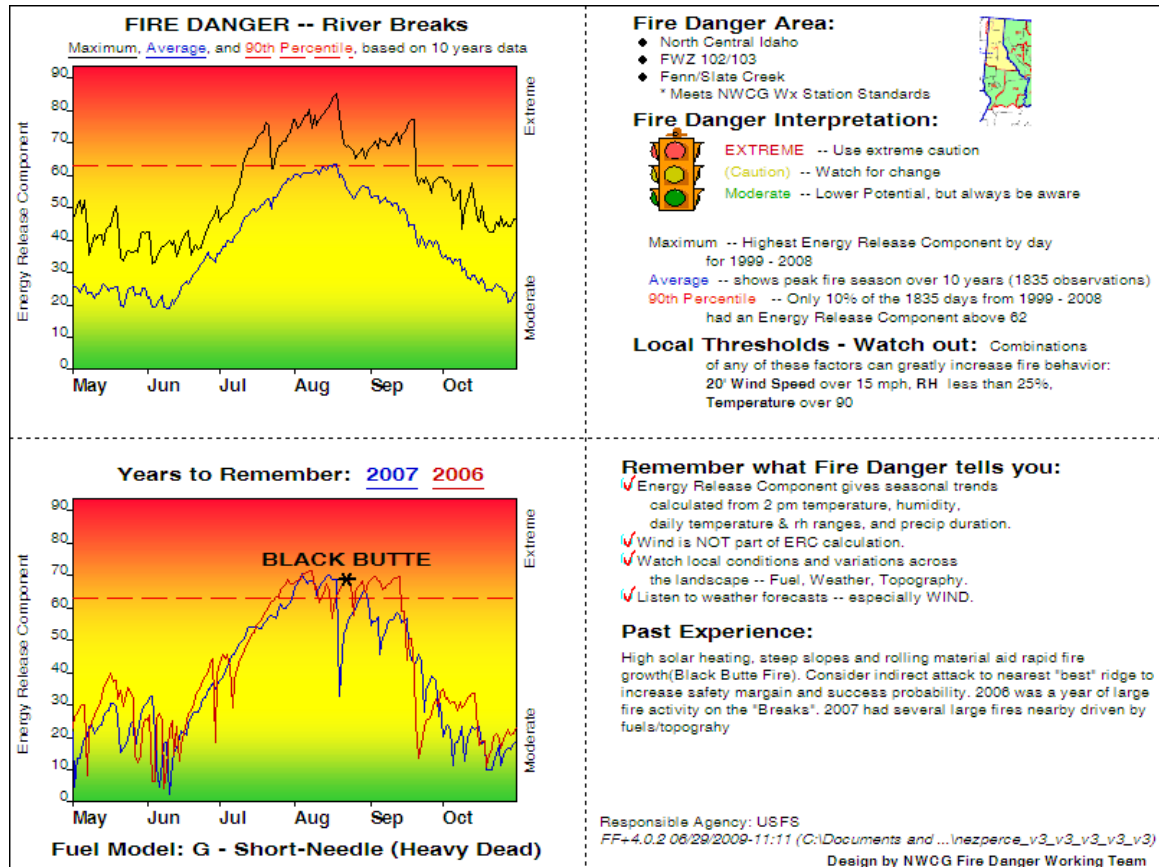
### **Pocket Cards**

The Clearwater, Nez Perce National Forests and the State of Idaho monitor fire danger fire behavior through a system of RAWS stations around the entire zone. Analysis of the energy release component for these stations found that there is a strong correlation between ERC and fire business when certain stations were grouped as special interest groups (SIGs) in Fire Family Plus. Pocket cards had been developed and approved for four different areas on the Clearwater and Nez Perce National Forest's using SIGs that included Powell, Pierce and Kelly Creek, Moose Creek and Red River RAWS and individually using ERC data from Powell and Slate Creek RAWS. These pocket cards used two different NFDRS fuel models 7G and 7C. Because of the two different fuel models used, the scales on the four cards were very different and allowed errors in interpretation if the observed ERC values used in the interpretation of the pocket card was the incorrect ERC. Analysis of two SIG's Slate Creek/Fenn and Powell/Moose Creek/Red River showed that fire danger can be displayed with two pocket cards. Both SIGS use NFDRS Fuel Model 7G in the analysis of the weather and fire history. The two pocket cards are:

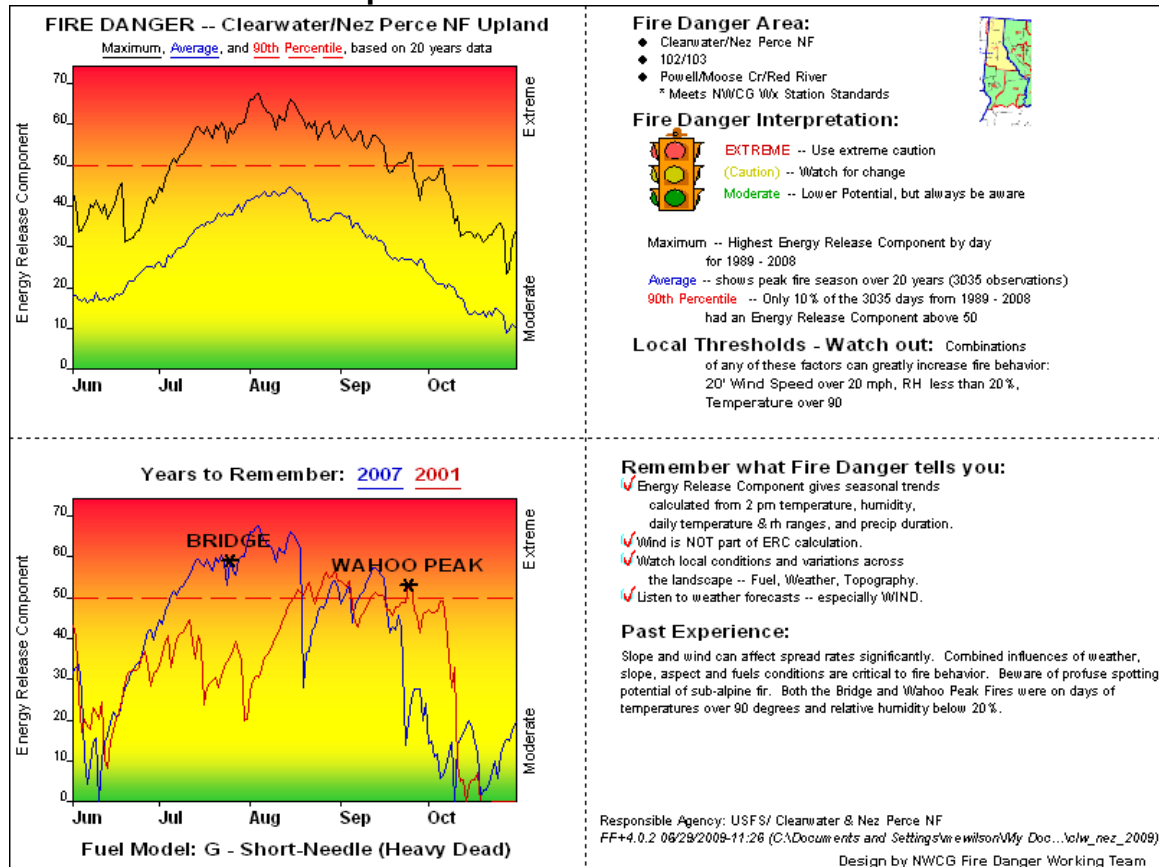
Clearwater/Nez Perce River breaks, defines the fire danger indicative of fires in the river breaks of the zone (Salmon, South Fork Clearwater, Middle Fork Clearwater, Selway and Lochsa) below 3000'

Clearwater/Nez Perce Uplands, defines the fire danger indicative of all other areas on the zone.

## Clearwater/Nez Perce River Breaks



## Clearwater/Nez Perce Uplands



## Appendix D

### Rationale for weighting of Slate-Fenn RAWS SIG

The time period of 1999 – 2008 was used to evaluate the correlation of the Slate Creek RAWS and Fenn RAWS for ERC values. Fuel Model G was used in the comparison to see if these two stations track fire and fuels conditions through the identified fire season on the Clearwater and Nez Perce National Forests (May 1 – October 31).

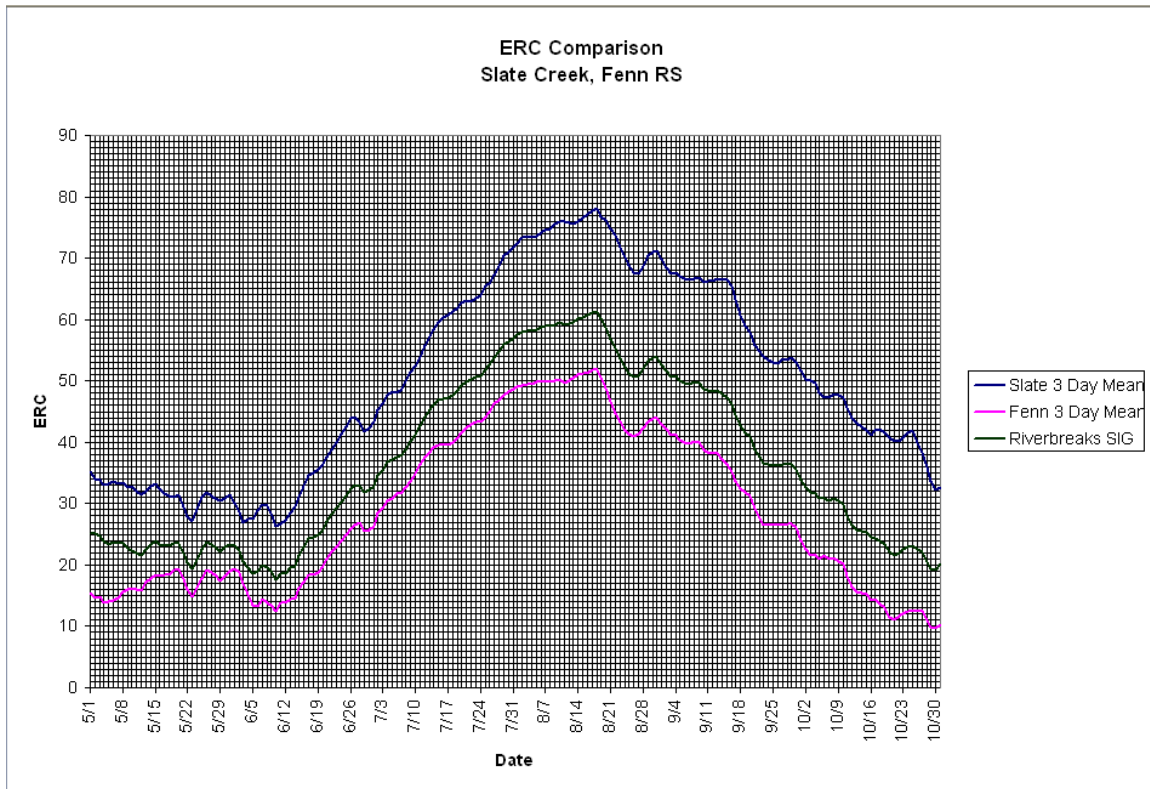


Fig 1

As shown in the figure 1, there is a strong correlation in the ERC values throughout the season between the two stations. The daily ERC value was compared to see there was an average difference between stations. Throughout the season the median difference between Slate Creek and Fenn RAWS was found to be 57%. This value fluctuates through the fire season with the greatest difference in July and August.

Median Difference in ERC values: (Fenn ERC is X% of Slate Creek RAWS)

May	54%
June	55%
July	66%
August	64%
September	55%
October	36%
Median	57%

From this median value the SIG (Special Interest Group) was weighted giving Slate Creek RAWS full weighting and Fenn 57% weighting.

The SIG was compared to both individual stations to ensure that Fire Danger Rating Adjectives tracked through the season. Throughout the season there is good tracking between the adjective ratings. Comparing Slate Creek to Fenn RAWS, the two stations show the same fire danger rating 75% of the season. October is the only month that the two stations do not correlate. Comparing the two stations to the SIG the correlation improves to 86%. Again the period of the year that has the greatest divergence is in October. This can be attributed to Fenn having much higher relative humidities during September and October as well as higher incidence of measurable precipitation. Almost all divergences in adjective rating throughout are towards a higher more conservative rating.